

Non-technical abstract

In spite of numerous advances in diagnosis and treatment, cancer including cancer of the head and neck is still a leading cause of death of American men and women. With few exceptions, the treatment has not changed in many years. Successful therapy for patients whose tumor has spread beyond the original site by the time of diagnosis has not yet been achieved. New therapeutic options are urgently needed. This proposal describes a new and novel form of immune therapy, which will enable the eventual treatment of patients at a very early stage of the disease. Treatment at this point has the greatest likelihood of success. Initially, our studies will be patients with advanced head and neck cancer. Many believe that immune-based therapy will become part of the overall management of cancer patients.

Development of the vaccine is based on the finding that head and neck cancer cells, like other types of cancer, form unique structures known as "cancer antigens." An immunity can be induced to cancer antigens, like the immunity to polio that develops in children who receive the polio vaccine. The vaccine is prepared by transferring DNA from the patient's cancer into a highly characterized cell line, which was modified previously to stimulate the immune system. DNA from the patient's tumor specifies an array of cancer antigens. The cell line expresses the genes for cancer antigens in such a way that, unlike the original tumor, they will stimulate a robust anti tumor immune response. Our preclinical studies in mice with cancer immunized with DNA-based vaccines developed immunity to the cancer and survived longer than mice in various control groups. Fortunately, toxic effects of the vaccine were not observed. Mice injected with the vaccine alone lived their anticipated life spans without evidence of disease. Tumor growth in mice injected only with the vaccine was not observed. To be certain that the vaccine is without possible harm to the patients in the proposed clinical trial, the vaccine will be subjected to lethal amounts of X-ray. This will eliminate the possibility that the vaccine itself will grow in the patient. The cells used to prepare the vaccine are not malignant; they are highly characterized normal fibroblasts.

Many believe that immune-based therapy will become part of the overall management of cancer therapy. Our expectation is that beneficial results will be achieved in patients receiving DNA-based vaccines along with conventional forms of treatment.